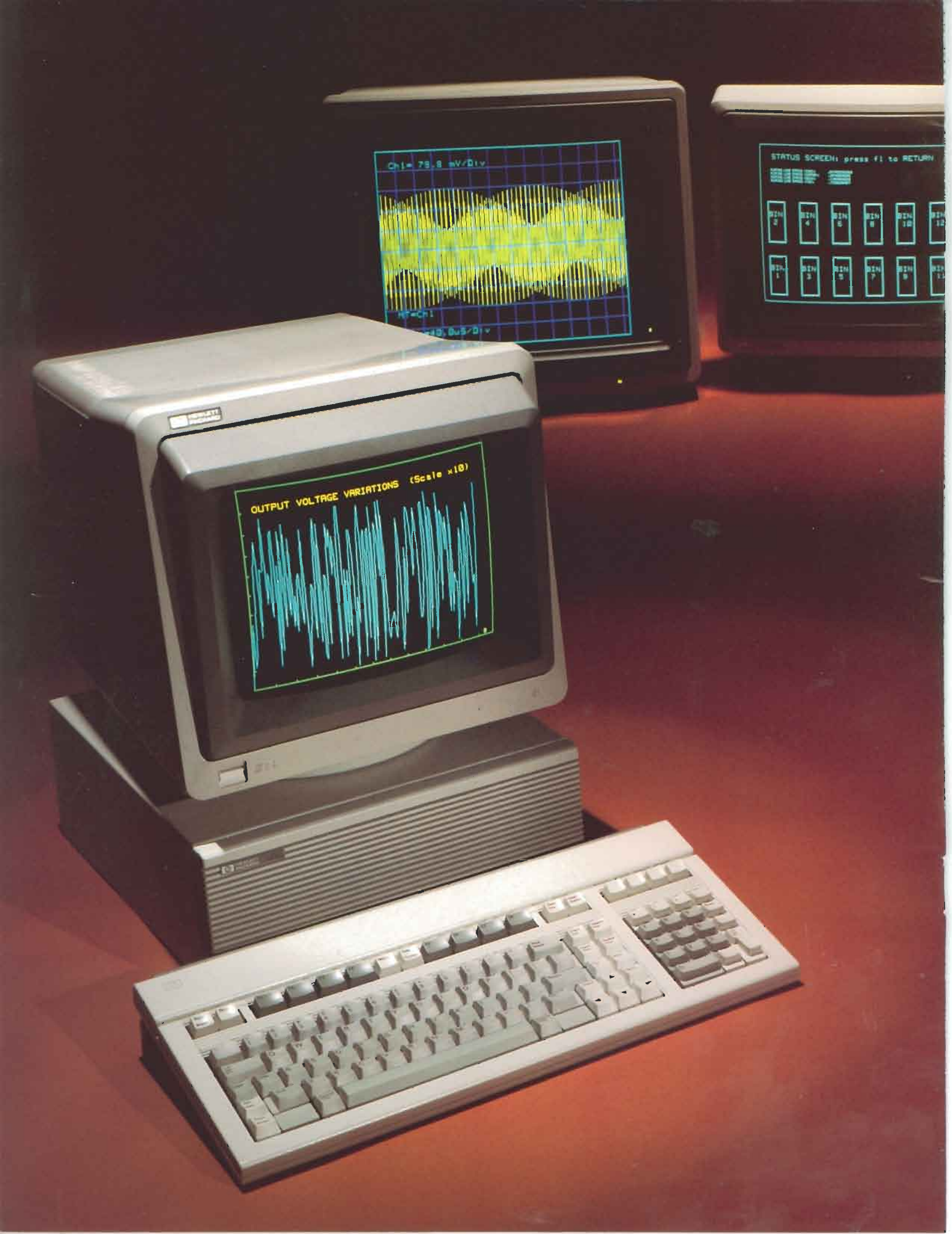
To get instrument systems running faster, you may have to create your own computer

HEWLETT PACKARD

Now you can HP 9000 Series 300


Ch1= 75.8 mV/Div
STATUS SCREEN: press f1 to RETURN
OUTPUT VOLTAGE VARIATIONS (Scale x10)

HP's new Series 300

New performance and productivity that plug in for low prices

■ Significantly improve the performance of existing systems. The new Series 300 is compatible with Series 200 products you currently use. Now you can run programs up to 1½ times or 4 times faster, depending on your choice of Series 300 processor.

■ You choose performance. Automate cost-sensitive production test systems with the Model 310 based on Motorola's 68010/10 Mhz processor. For other data acquisition, analysis or automated test systems you'll want the Model 320's performance based on the MC68020/16.6 Mhz processor. Either way, the advantage of choice is yours.

■ You'll like the price, especially once you talk with an HP Field Sales Engineer. A representative can show you how performance, in the system configuration you want, now costs less with the Series 300.

■ Use your Series 200 software.

■ You don't have to become a programming expert to write instrument control programs. We've been tuning our version of BASIC for instrument applications since 1972. Use these enhancements on the Series 300 and save the time for your real job.

Pascal is with us too, offering programming efficiency for those who write high level or complex programs and compiled performance for those who need it.

■ Automating an instrument system is easy with the Series 300. We invented HP-IB, now industry standard IEEE-488, to make system building a simple matter—just plug computer, instruments, and peripherals together.

■ HP's current offering of computers, peripherals, and instruments stands at 1,400. With that many choices available, you'll have all the right equipment for a complete system. And you'll establish the responsibility for compatibility and service with a single source—HP.

■ Muscle building. Add RAM, computational performance, and instrument I/O to the Series 300—at any time.

- Built-in HP-IB, RS-232, and HP-HIL interfaces.
- 4-slot card cage for additional I/O or RAM memory cards.
- Expander box gives 8 more slots, without degrading performance!
- You can even upgrade from the MC68010 CPU to the MC68020 CPU by yourself.

■ Four new displays let you choose to work in black & white or color, with medium- or high-resolution. 60 Hz operation and non-interlaced technology eliminates display flicker.

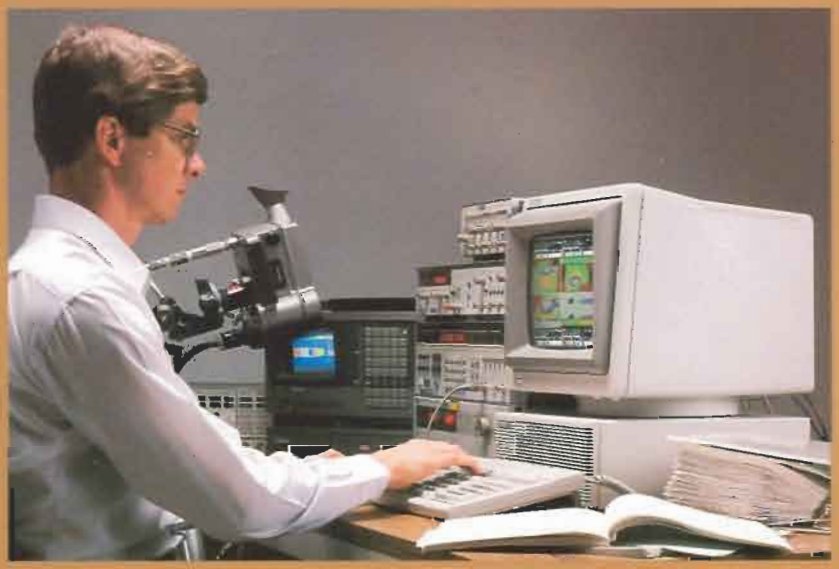
■ Count on the Series 300. Ask your HPrepresentative about service costs. Better than anything else, these low costs demonstrate continued high reliability for all HP products.

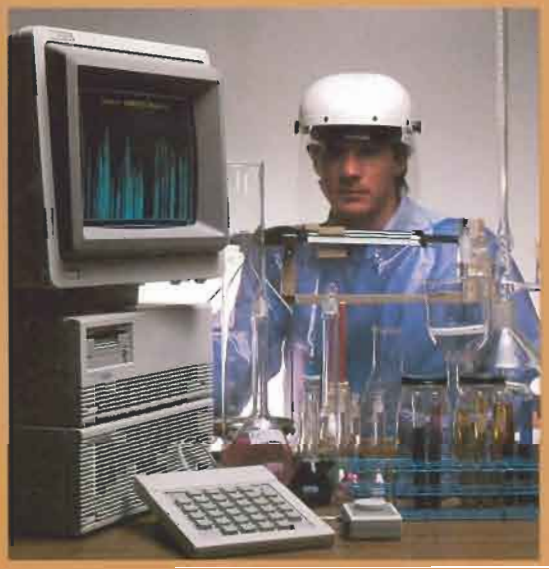
Productivity building with the Series 300

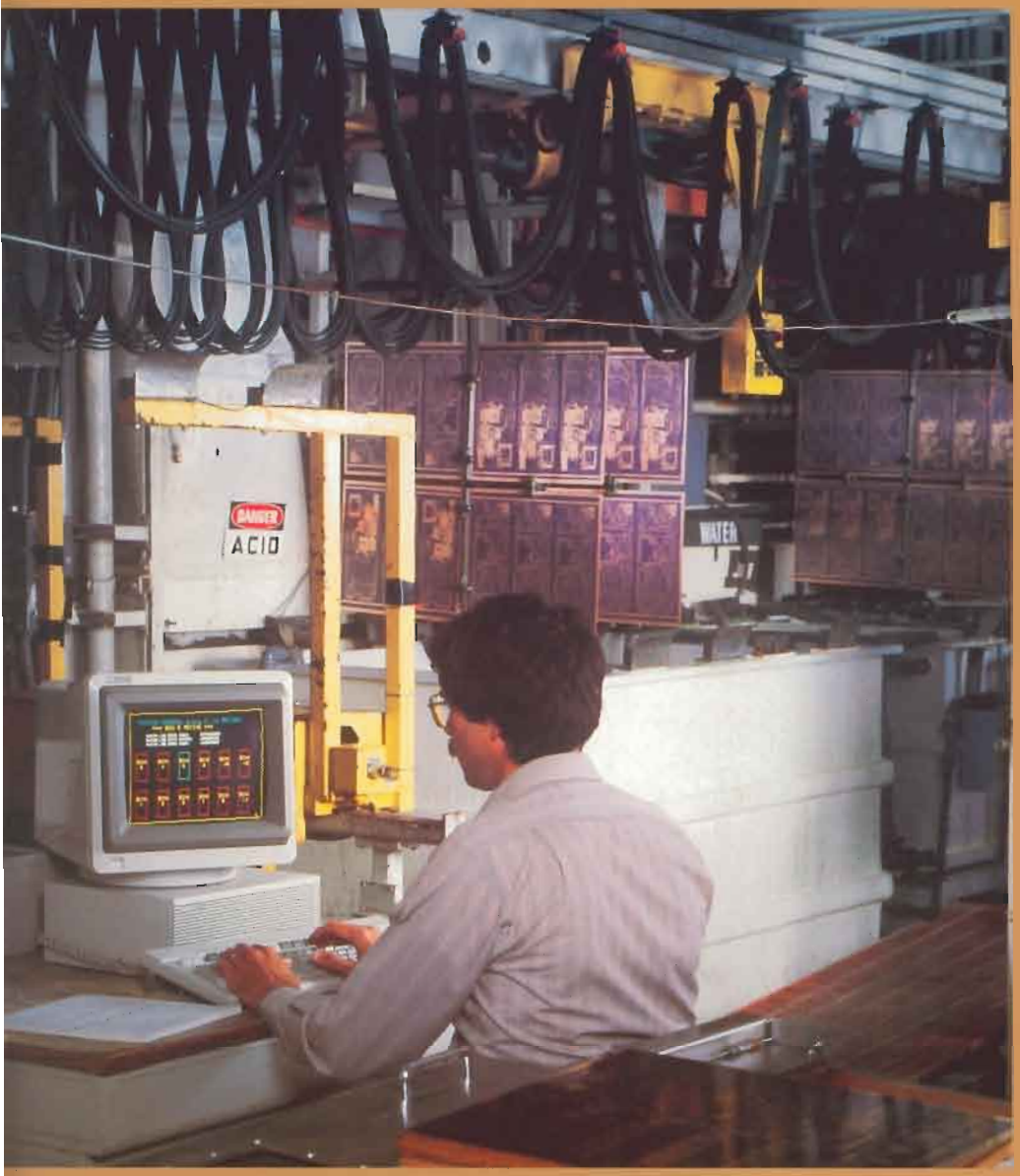
Hewlett-Packard's Series 300 offers the kind of flexibility that makes it easy to build productivity into automated measurement, analysis, and test systems.

Because automated applications have unique requirements, take advantage of a computer that you've "built" to be exactly what you need—no more, no less. And when you decide to improve productivity in jobs outside of your initial application, the Series 300 lets you add capabilities easily.

Yet you'll find that Series 300 performance, functionality, and expansion capabilities can be yours for the price of a personal computer.







Manufacturing and Industrial Monitoring

Accurate monitoring of analog or digital signals is key to a manufacturer's product quality. The Series 300 combines computational speed and reliability so you have real-time information even in harsh environments. Immediately spot trends or deviations in critical variables or processes. And of course, you can use the Series 300 to generate historical reports or trends.

Laboratory Monitoring and Analysis

Automate your analytical procedures with the Series 300. Programs are easy to write and easy to use. Yet you have a sophisticated means of data reduction and efficient management of samples, information, and materials throughout the lab.

Computer-Aided Testing

Install the Series 300 in computer-aided test systems to improve diagnostic reporting and speed analysis. A Series 300 computer, coupled with high speed data acquisition instruments, lets you capture and analyze transients in real-time, gives you an alternative to statistical analysis.

Engineering Evaluation and Analysis

Engineers and professionals use the Series 300 to evaluate and analyze the performance of products under investigation and development. Series 300 computers and operating systems are optimized to work with *instruments, making it easier to* assemble instrument systems with higher speed, accuracy, repeatability, and productivity.

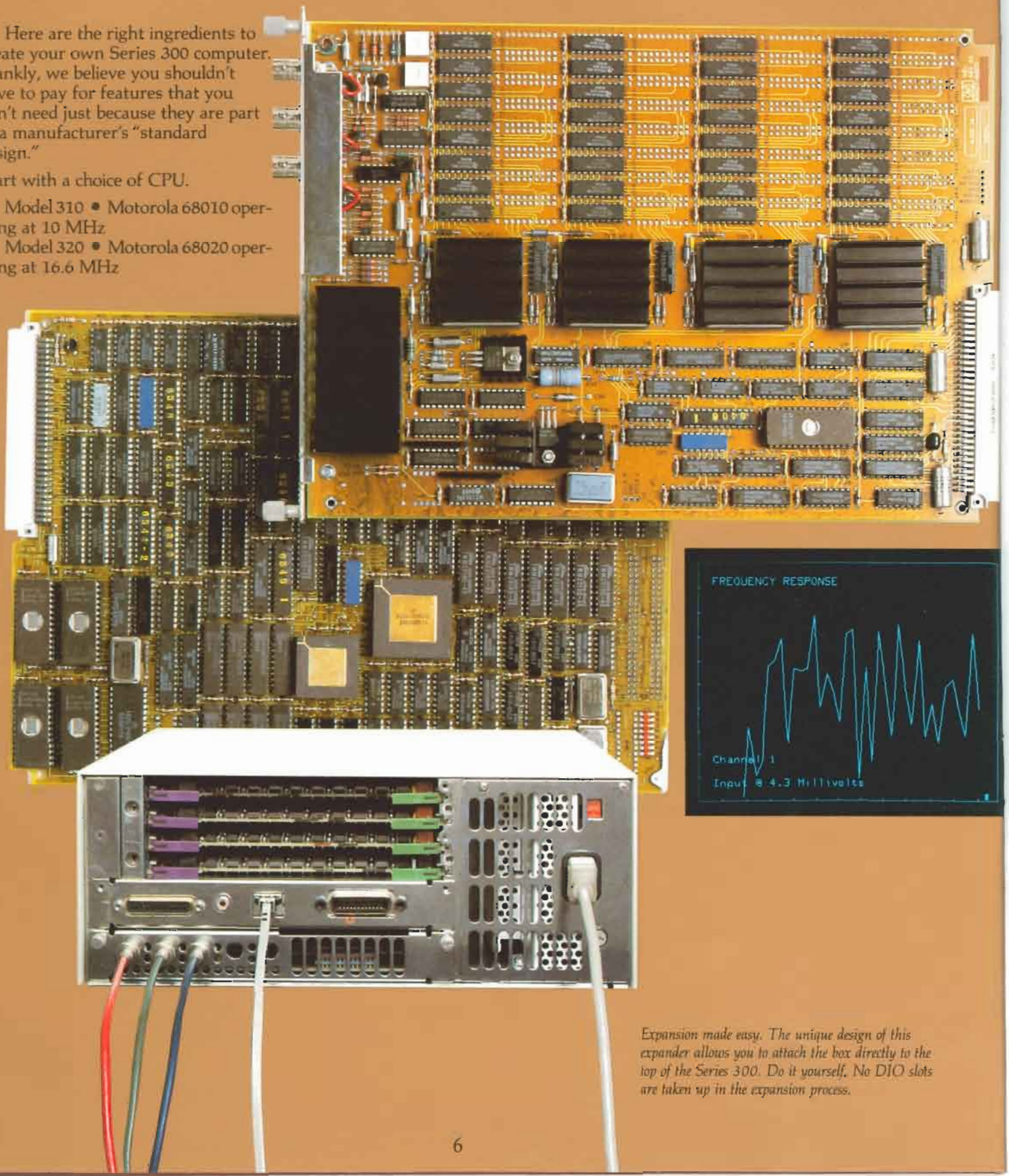
The right ingredients make the right computer

Here are the right ingredients to create your own Series 300 computer. Frankly, we believe you shouldn't have to pay for features that you don't need just because they are part of a manufacturer's "standard design."

Start with a choice of CPU.

Model 310 • Motorola 68010 operating at 10 MHz

Model 320 • Motorola 68020 operating at 16.6 MHz



Expansion made easy. The unique design of this expander allows you to attach the box directly to the top of the Series 300. Do it yourself. No DIO slots are taken up in the expansion process.

Model 310 is a very capable computer for automating measurement, analysis, and test functions. It is based on the MC68010. This cost-effective system typically includes built-in 512 Kbytes or 1 Mbyte RAM, HP-IB, RS-232, and HP-HIL interfaces, DIO slots, audio, and video output for the 12-inch monochrome display. It also features a battery-backed real-time clock. All this is on one board.

Two system slots hold the CPU and video output cards. A 4-slot DIO card cage accepts all Series 200 RAM and I/O cards. That means you can upgrade to Series 300 computational performance and still preserve the investments you may already have in Series 200 equipment. You can have up to 5 Mbytes total RAM in the main system.

Model 320, with the MC68020 processor, is the foundation for a high performance system for data intensive applications. Here is a 32-bit CPU operating at 16.6 MHz, with a 16 Kbyte cache, and Motorola 68881 floating point math coprocessor.

The Model 320 computer features the same two system slots and 4 DIO slots as the Model 310. However, 2 DIO slots are used in Model 320 for a 1 Mbyte RAM card and an interface card with HP-IB, RS-232, HP-HIL, audio, and a slot for your choice of monitor.

In addition to the memory and I/O you can add to either model with the 4-slot DIO card cage, HP makes it easy for you to get 8 more DIO slots with an optional expander box.

These expansion options give you greater flexibility to balance memory requirements for large programs and all the I/O devices that you need. Control the most complex or data intensive applications by addding up to 7.5 Mbytes RAM—without degrading performance. Or, use the Series 300 expander to add as many as 6 interface cards plus 6 RAM and accessory cards.

You can also optimize the transfer rates of your system with additional I/O slots. With the available slots you can put the fast and slow instruments on separate HP-IB interfaces and improve system speed.

Choose any one of four new displays. For the lowest cost alpha *and* graphic capabilities, choose the 512 x 400 pixel resolution monochrome display. A low cost color display of the same resolution is also available. For the sharpest, clearest possible graphic displays, select the larger 1024 x 768 monochrome or color displays.

Current Series 200 professionals may want to use some of the DIO slots to add our inexpensive Series 200 display compatibility cards. In most cases, the programs you've written for Series 200 hardware will run on the Series 300.

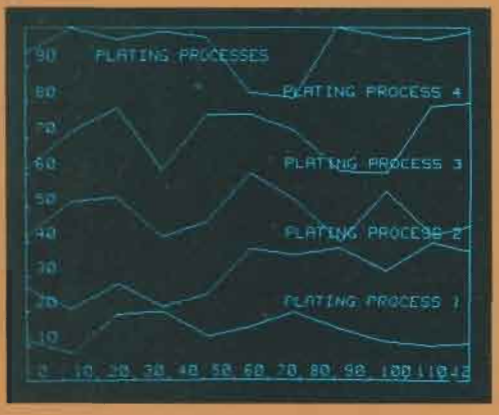
For more information, please consult the Supplement for Series 300 Compatibility.

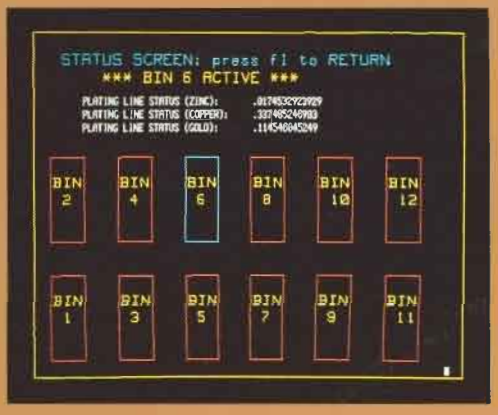
HP's organized approach to packaging makes it easy to work with the Series 300. Series 300 utilizes a 325 mm package suitable for an office desktop, or use the 19-inch rackmount for the lab or production area.

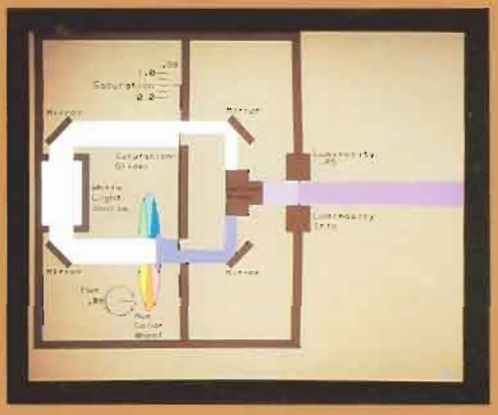
Move the Series 300 to different stations and control different instruments with the optional taboret. This cabinet on wheels is big enough to house the CPU, expander, and data storage devices, but it's small enough to fit underneath a lab bench.

Make it easy for production personnel to operate the Series 300—let them "touch-in" parameters with the HP Touchscreen, in monochrome or color, and eliminate keystrokes.

Tough enough. For harsh production and factory floor applications, an optional magnetic bubble memory card provides non-volatile memory where conventional data storage devices are impractical.







Reduce the overall cost of test stations with Series 300 execute-only systems. Configure one Series 300 for program development and all others as execute-only controllers. An EPROM card enables you to load execute-only programs which are secure and cannot be changed by the operator. Upgrade those dedicated controllers later to development stations as your needs grow.

Speeding costs less

Using BASIC and HP-IB, the Model 310 transfers data at a very fast 124 Kbytes/sec. At this rate, your instruments and peripherals will determine the rates of data transfer on the HP-IB bus. Some faster I/O devices may require a different I/O technique—direct memory access (DMA). In this case, it's easy to install an optional DMA card and boost the Model 310's continuous transfer rate to 329 Kbytes/sec.

Ultimately, there are instruments that demand faster transfer or computational rates—for short term high speed samplings, burst measurements, or block memory transfers. Model 320 continuously transfers 207 Kbytes/sec. Using DMA, that's improved up to 349 Kbytes/sec.

Disc transfer rates for the Series 300 using DMA are 800 Kbytes/sec (even faster using Pascal and the optional high speed HP-IB disk interface).

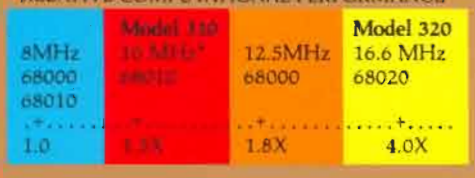
	Continuous Data Transfer Rate (Kbytes/sec)	w/DMA (Kbytes/sec)
Model 310	124	329
Model 320	207	349

Now that data can be moved so quickly, you'll want computational speed to match. You want to analyze an entire day's worth of test data quickly. Or spot a declining quality trend before it costs you.

We think you'll see from these indicators, that the Series 300 gives you clear performance improvements—to run an existing system faster or implement a fast, new system.

HP's 68000 Performance Family

RELATIVE COMPUTATIONAL PERFORMANCE



* With on-board RAM. Off-board RAM performance is 1.25X

BASIC additions that multiply your productivity

While the price of Series 300 computers drops the price of high performance instrument control, there are less expensive computers that appear to offer similar control capability. But, consider the improved program development productivity, faster data transfer, and execution speed while using Series 300 which offset any price advantage of personal computers.

By designing I/O functions into the languages and operating systems, we've removed many complex, time-consuming tasks of programming. Twenty special HP-IB commands of HP's enhanced BASIC are dedicated to instrument control. Both interrupts and overhead processing occur automatically so that input/output instructions to an HP-IB device become transparent. With just a single statement you can transfer output from the Series 300 or mass storage device, for example, to a printer or plotter.

HP's system of buffered I/O transfers allow continuous execution of a program while data transfers are taking place. This technique is a real plus when your system includes either very slow or fast devices because it transfers device output to a section of memory which accepts the unformatted data. Data is stored there until the transfer and the data can be processed.

Respond to priority interrupts without interfering with continuously operating programs. Servicing these interrupts is handled real-time. Plus, these routines are easily written with HP BASIC, not in an assembly language that's difficult to use.

HP BASIC speeds I/O processes through "unified I/O." All the information necessary for executing I/O processes is set up prior to the actual information exchange. This removes overhead time and gives you greatest flexibility in changing the device assignments without disrupting a program.

If you've written programs in less efficient versions of BASIC, then you can appreciate how helpful HP BASIC is. Our BASIC discovers syntax errors as you enter the code. A pre-run error check flags the program branching errors for you. These two features alone can save you hours of trial-and-error.

Other HP BASIC enhancements include:

- Interactive Editing—The editor is always available and gives you the ability to search and replace strings or to copy blocks of lines.
- Structured programming keeps you organized. Modular program structures, independent subprograms with local variables as well as global data storage, pass by reference and pass by value parameters, and run-time program linking are features HP BASIC offers to advanced programmers.
- Powerful input and output data formatting capabilities are built in and accessible through simple, high level commands.

Programmers who write lots of software like HP Pascal for it's efficiency. For starters, you have a highly structured environment so that programs are clear, yet concise and can be readily maintained. Pascal offers complete I/O and graphics libraries; you don't duplicate work that's already been done.

Pascal also offers compiler execution speed for low-level data manipulation, security for protection from program modification, and I/O and graphics libraries.

When you need to write your own I/O drivers for maximum speed or for unique applications such as a need to restructure data before you output it for use, then Pascal offers the needed flexibility.

A FORTRAN 77 compiler for the Pascal operating system is available through HP's Third Party program. And of course, our enhanced implementation of the HP-UX operating system also runs on the Series 300. HP-UX brings with it the C, FORTRAN 77, and Pascal compilers as well as our device I/O library. The Pascal compiler on HP-UX is the same compiler that runs on the standalone Pascal computer.

Run Series 200 programs faster, run them on Series 300

Software Compatibility

Series 300 is compatible with Series 200 BASIC, Pascal, and HP-UX operating systems.

You can start writing programs in BASIC 4.0 on your existing workstations and the new Series 300 computers. Your BASIC 3.0 programs will still run on the new hardware, and they'll run faster.

Even if you're not already a BASIC 3.0 user, we can still help. A keyboard emulation mode will enable software written with 2.0 or 2.1 to run on the Series 300.

Pascal 3.1 is being introduced with Series 300 and runs on all Series 200 workstations. It is object code compatible with Pascal 3.0 programs so there is no need for recompiling programs in order to move to the Series 300.

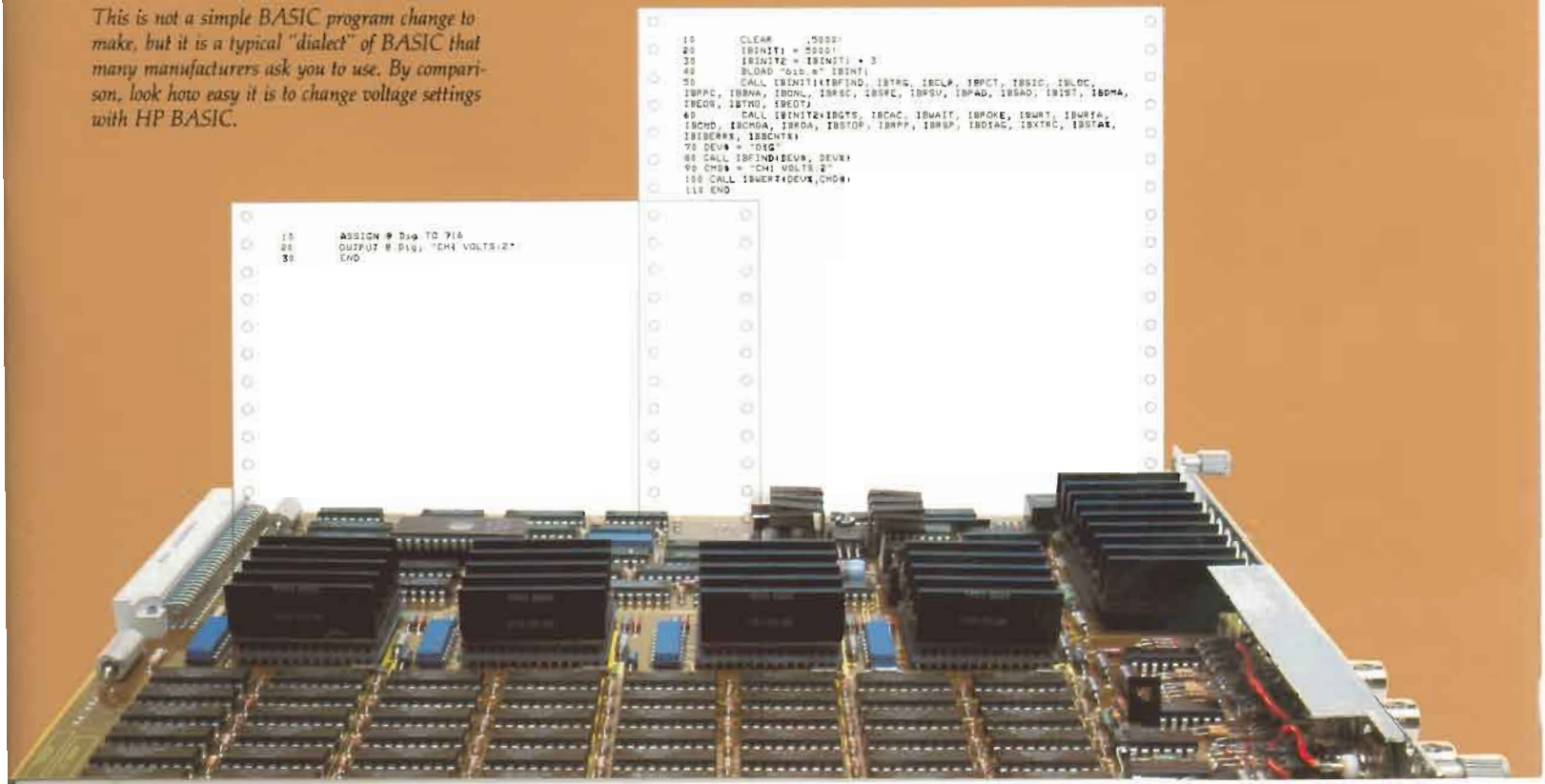
Here are the programs we've tested to run on the Series 300 when using the Series 200 display compatibility interface.

- Context MBA
- Picture Perfect
- Diagraph
- Graphics Editor/200
- Text Editor/200
- Data Grapher/200

For more information about compatibility with the HP Series 200 workstations and peripherals, please see the Supplement for Series 300 Compatibility.

* HP EGS and HP Tech Writer programs can be used on the Series 300 without the display compatibility interface.

This is not a simple BASIC program change to make, but it is a typical "dialect" of BASIC that many manufacturers ask you to use. By comparison, look how easy it is to change voltage settings with HP BASIC.



Plug compatibility and growth

There are two clear benefits you derive from the excellent plug compatiblity between HP's technical computers, peripherals, and the entire current offering of 1,400 HP instruments and accessories:

1. You are guaranteed compatibility between the Series 300 computer, the instruments, and peripherals from which you can choose to build your system.

2. You are not trapped when needs grow beyond your immediate intentions and application. Add performance upgrades as you require. You also have easy access and control of as many instruments and peripherals as necessary through a number of interface devices—without having to write or rewrite programs.

- 512 Kbyte EPROM Interface Card
- 2-Channel DMA Controller
- 16-Bit Parallel Interface
- 43-line BCD Interface Memory Board
- HP-IB Interface
- HP-IB High Speed Disc Interface
- RS-232C (Serial) Interface
- 1 Mbyte RAM with parity check
- 256 Kbyte RAM
- 128 Kbyte Magnetic Bubble Memory
- Floating Point Math Card
- RGB Color Video Output Card
- Datacomm Interface
- Shared Resource Management Interface
- HP 6944 Multiprogrammer Interface
- 7-Channel Analog to Digital Interface
- Breadboard Interface
- Programmable Datacomm Interface

One more thing that makes HP systems easy . . . you need only call one HP sales engineer to configure a system. And it takes only one phone call to HP to receive support and service.

SRM—Your "Data Control Center"

When your facility requires multiple stations, Shared Resource Management (SRM) can save lots of time and money. SRM consolidates the control of data and information among your network of computers, instruments, and peripherals. One person can control several test stations, move the output to one mass storage device, and analyze the data with one Series 300 computer. Then transmit the results to a printer or plotter for a hardcopy.

Without ever exchanging paper or a floppy disc, you can transmit and share programs, data, test analysis, and memos. An SRM's system disc is a "central file," allowing everyone access to the same programs, the most recent data.

So you save time. You also save the cost of extra peripherals because stations share disc drives, printers, and plotters. New SRM hardware gives you low cost network links that can be 1000 meters long, serving 25 stations each, and uses thin, inexpensive coax cabling.

Tested here to work there

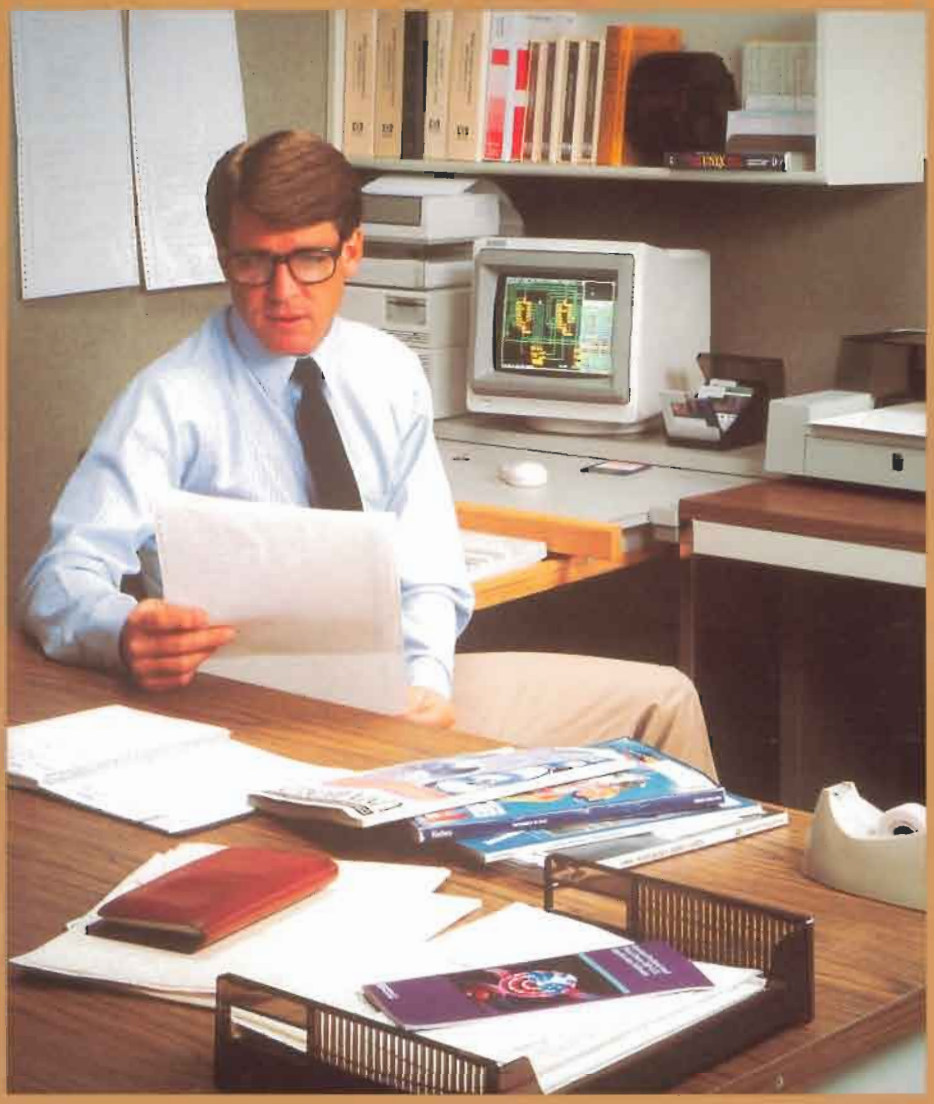
The Series 300 is an enduring performer. After the air conditioning goes out or if the utility suffers a brownout, HP product testing assures you still have a computer that works.

Keep in mind that computational gear which doesn't break down, is readily expandable, and for which the manufacturer provides first-rate service will show the ultimate wisdom of a purchase decision.

CPUs are certified for operation from –0°C to +55°C. Humidity from 5% to 95%.

Series 300 computers operate after direct electrostatic discharges to 15 kV, power line surges of 1 kV, and with line voltages as low as 80 volts and as much as 138 volts.

It does other work



Series 300 plus the right application software lets you do other work faster too. With the same flexibility you have to create an automated instrument system, you can also choose the ingredients to do personal and business paperwork, accounting, electronic mail, and spreadsheets. And HP-UX capability offers you the basis of accessing rapidly growing numbers of UNIX™-based productivity solutions.

Or, combine Series 300 and high performance hardware options like the 19-inch high-resolution, bit-mapped color monitor, and HP-UX. Now you have a sophisticated mechanical/electrical design system. To see more about these design capabilities, ask for our Series 300 Design Automation brochure (5953-9558).

Picture Perfect™
Transform data into vertical or horizontal bar charts, pie charts, line charts, or a combination of bar/line charts.

Diagraph™
A library of over 1,600 clip-art symbols let you create unique charts diagrams, and presentations.

Data Grapher/200
Use your computer as a data analysis and display tool. It can be merged with HP TechWriter.

Graphics Editor/200
A general purpose drawing program for creating charts, diagrams, and presentations. It can be merged with HP TechWriter.

Text Editor/200
Turn your computer into a text processor that makes it easy to write reports, memos, and high quality letters.

Context MBA™
Produce and manage information, the business paperwork that comes with every job. Six functions are combined in MBA: spreadsheet modeling, graphics, word processing, database management, forms, and telecommunications.

HP TechWriter
Using this program you can take pictures from your graphics program and merge them in your word processing document.

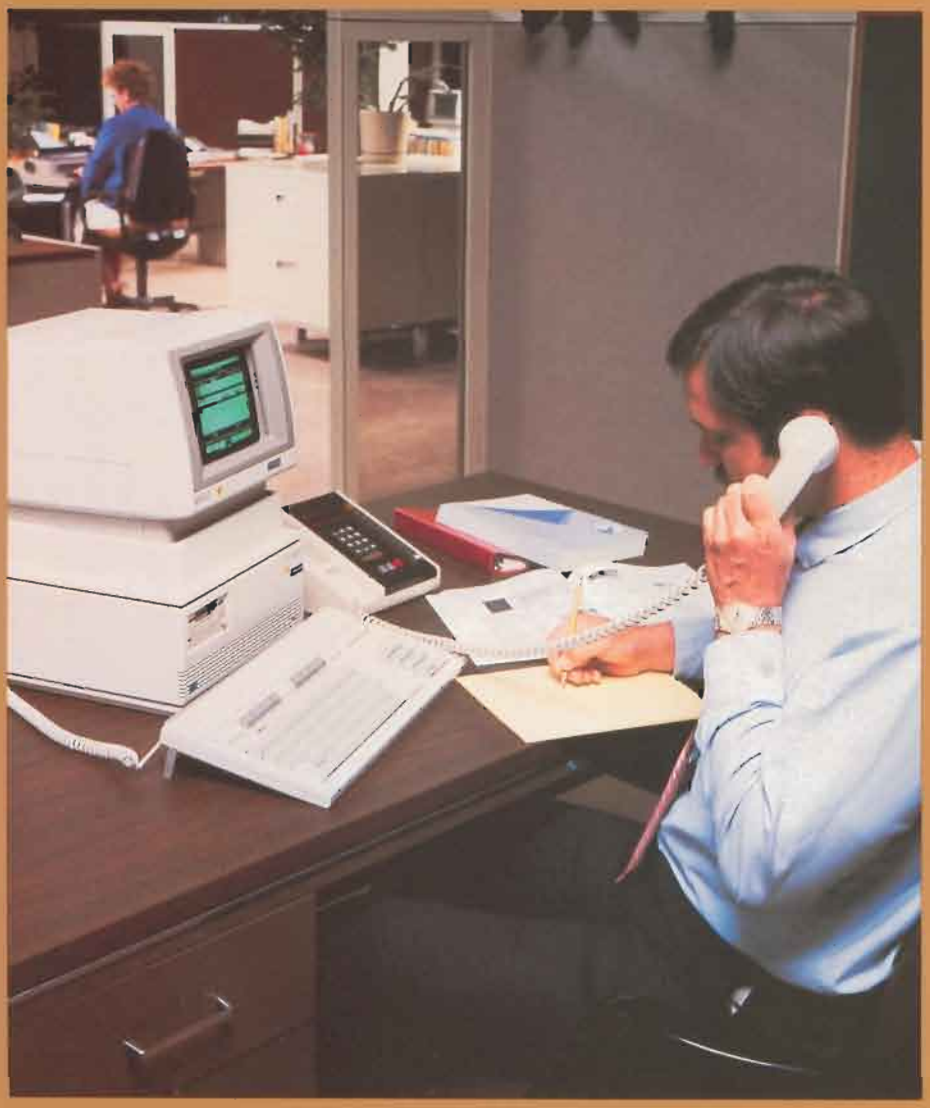
HP EGS
A powerful design system for engineers. This 2-D engineering graphics system helps engineers create a complete range of mechanical, electrical, and general drawings.

Picture Perfect is a trademark of Computer Support Corporation

Diagraph is a trademark licensed to Computer Support Corporation

Context MBA is a trademark of Context Management Systems

UNIX is a trademark of AT&T



Support Services

Series 300 carries a one year, return-to-HP Field Repair Center warranty. If you prefer, the warranty can be changed at no additional cost to 90-day, on-site coverage for the computer and peripherals that are ordered as a coordinated shipment.

For the U.S. sales office nearest you:

Call 1-800-522-FAST (U.S. only). In Colorado call collect 223-9717.

In Europe contact your local HP sales office, or write to:

Central Mailing Department,
PO Box 529, 1180 AM
Amstelveen, The Netherlands

For other locations, please consult your local telephone directory.

Printed in U.S.A. 6/85 (55M)
5953-9559